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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/014,619

12/10/2001

Paul L. Frattini

060825-0306US

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12/15/2006

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EXAMINER

AWAI, ALEXANDRA F

ART UNIT

PAPER NUMBER

3663

DATE MAILED: 12/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/014,619

Applicant(s)

FRATTINI ET AL.

Examiner

Alexandra Awai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-35 and 37-40 is/are pending in the application.
- 4a) Of the above claim(s) 23,27 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21,22,24-26,29-35 and 37-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. This Non-Final Rejection is intended to replace the Office Action dated 7/7/2006, which failed to specifically address relevant issues in the Declaration under 37 C.F.R. 1.132 filed 1/19/2005. These issues pertain to the application of Kato et al. as a primary reference in an obviousness rejection. No additional response directed to the Office Action dated 7/7/2006 is required.

Response to Arguments

2. Applicant's arguments filed 4/28/2006 have been fully considered but they are not in every respect persuasive. Those rejections that have been overcome by amendment are omitted from the present Office Action and are to be considered withdrawn. As will become apparent, certain arguments posed by Applicant have been rendered moot by new grounds of rejection. Currently amended claims 21, 25, 31, 34, 35, 37 and 40, as well as previously presented claims 22, 26, 29, 30, 32, 33, 38 and 19 have been examined.

With regard to the remarks concerning Fiorenzo, it is noted that the teaching to which applicant refers (i.e., maintaining the integrity of fuel pellets) is not a recited feature in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Moreover, such a limitation would be an expression relating the apparatus to contents thereof during an intended operation, and therefore would be without patentable weight (see MPEP § 2115). The "efficiency" of an apparatus is directly related to its

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intended use. For instance, ultrasonic transducers configured for position detection or deformation inspection are extremely efficient as position and deformation detectors, but are extremely *inefficient* as cleaning devices. Skilled artisans are knowledgeable about configuring and positioning ultrasonic transducers according to a desired or intended effect – i.e., if 1 W/cm^2 is too great a power density for the intended use, a skilled artisan would immediately appreciate the advantage of reducing the power input, and would be fully capable of performing that technically trivial modification.

With regard to the comments submitted by David J. Gross in the aforementioned declaration concerning Kato et al., the most important according to this examiner's understanding is the following:

“For this type of energy to be incident on the “wave reflecting structure” from the “perpendicular (90 direction)”, the reflecting structure would need to be cylindrical, and all of the transducers would need to be concentric with a reflector, i.e., the transducers would have to be placed in the center of the cylindrical object, which is not shown by Kato (see, e.g., Kato Figure 6, which shows the transducers placed within a square structure)” (Declaration, p. 3).

This reason, as well as the others submitted, is apparently provided in order to buttress the argument that omnidirectional transducers are incompatible with the disclosure of Kato et al., which teach the use of a reflecting housing having a square-shaped cross-section and planar transducers. The conclusion Applicant therefore draws is that it would *not* have been obvious to substitute omnidirectional transducers as taught by Walter et al in the apparatus of Kato et al.

Applicant provided this declaration in response to obviousness rejections set forth by Examiner Palabrica on 7/20/2004 that cited Kato et al. However, it is noted that the obviousness rejections citing Kato et al. in this Office Action and that dated 7/7/2006 do not apply the teachings of Kato et al. in the same way as the rejection submitted on 7/20/2004. For instance,

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previously Examiner Palabrica read Applicant's claimed housing on item 127 of the figures in Kato et al. without specifically arguing that this structure is optionally cylindrical. In this and the previous Office Action, Examiner specifically cites "cylindrical wash chamber (31)" (Office Action dated 7/7/2006, section 6). Additionally, Examiner presently notes that Kato et al. teach that although the pictured embodiment comprises a steel housing (127) that has a square cross-section, "there would be no problems at all if it were in particular cylindrical in shape" (col. 9, lines 49-52). Accordingly, it is not the square embodiment that is being interpreted as equivalent to the claimed elongated housing, but rather the prior art cylindrical housing or the disclosed cylindrical alternative embodiment. As such, it is clear that the inapplicability as argued by David J. Gross does not exist. Furthermore, it is not required that the transducers be concentric with the cylindrical reflector in order to confer efficiency advantages to the invention, and Applicant is not claiming this feature.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 30, 33, 34, 35, 38 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 30, 33, 34 and 40 are inconsistent with the specification because they encompass an embodiment wherein the reflecting surfaces of the reflector are distinct structures from the housing (MPEP 2173.03). As stated on page 12 of the

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specification, the housing *includes* a reflector, and there is no disclosure of a circular cylindrical reflector other than that best shown in Figs. 10-12.

Claim 35 is indefinite because the predetermined direction in which the elongated housing extends is ambiguous. It is inherent that the elongated housing extends in all three dimensions, and the claim does not give any reference structure that might establish the directionality of the predetermined direction. Similarly, the statement that the plurality of transducers is positioned axially is indefinite because no axis (of either the transducers or the housing) has been explicitly recited. Additionally, an "axial" position only communicates that the position is in some way related to an axis, but fails to establish what that relationship entails.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 21, 22, 24, 25, 26, 29, 31, 32 and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al., and further in view of Walter et al.

Insofar as the claims are understood despite issues of indefiniteness as discussed above, they are rendered obvious by the cited prior art. Kato et al. disclose as prior art an ultrasonic cleaning system (Figs. 3 and 4) comprising a circular cylindrical wash chamber (31) sized to contain a fuel assembly (32) and an ultrasonic transducer (33) arranged parallel to it (claims 22, 29 and 38). This wash chamber embodies the presently claimed housing. Kato et al. improve upon this prior art device by fashioning a transducer assembly consisting of a movable housing unit (127) comprising four pluralities (eight) of ultrasonic transducers (111) that are arranged on the housing so that each one of the four pluralities is adjacent to a different one of the four sides of the fuel assembly (105). Kato et al. teach that although the pictured embodiment comprises a steel housing (127) that has a square cross-section, "there would be no problems at all if it were in particular cylindrical in shape" (col. 9, lines 49-52).

It would have been obvious at the time of invention to modify the housing (wash chamber) as disclosed by the prior art by positioning (making integral) pluralities of ultrasonic transducers adjacent to the four sides of the fuel assembly housed therein, as is done with the housing unit taught by Kato et al. The motivation to make this modification would be to obtain the advantage of uniformity of radiation made achievable using multiple transducers (col. 7, lines 28-32), while implementing an old and easily manufactured apparatus as taught by the prior art (col. 3, lines 20+). Alternatively, Kato et al. may be considered as directly anticipating the

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feature of having ultrasonic transducers positioned on a cylindrical elongated housing because of the aforementioned teaching regarding the alternative cylindrical version of the steel housing. It is within the purview of the skilled artisan to advantageously position the transducers within this known structure.

Additionally, it would have been obvious to multiply the number of transducer assemblies made integral with the wash chamber as such is no more than duplication of parts with an expected result (MPEP § 2144.04(IV)(B)). This expected result would be that, in addition to now uniformly irradiating all four sides of the fuel assembly, up to the entire length of the assembly could be uniformly cleaned. Making this obvious modification would encompass the limitations of claims 24 and 26 in particular.

Kato et al. fail to teach that the ultrasonic transducers are omnidirectional transducers. However, as disclosed by Applicant, the omnidirectional transducers of the present claims – which are configured to accomplish the intended uses recited in claims 21, 31, 37 and 39 – are embodied by ultrasonic transducer design taught by Walter et al. (specification, p. 5). It would have been obvious to use the transducers taught by Walter et al. as the transducers (111) of the apparatus disclosed and taught by Kato et al. because the aforementioned transducer design is an improved version of a device for ultrasonic cleaning equipment (col. 1, lines 13-14). The alternate cylindrical shape of the steel housing (127) is entirely compatible with the omnidirectional transducers as established by the declaration dated 1/19/2005. A skilled artisan would choose to employ the improved transducer in order to obtain the numerous advantages disclosed by Walter et al. (col. 1, lines 68+), which are entirely compatible with the cleaning system disclosed and taught by Kato et al.

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8. Claims 30, 33, 34, 35 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. and Walter et al. as applied to claims 21, 31, 37 and 38 above, and further in view of Richardson et al.

Kato et al. disclose an ultrasonic wave leakage prevention structure (131) – a reflector – that would have been obvious to utilize in the hypothetical obvious apparatus discussed in the previous section, as such is no more than the advantageous application of a known expedient in the art. Preventing leakage improves the efficiency of the device, and the geometry of the reflector system is obvious to an artisan as argued by the previous examiner (Office Action dated 5/9/2005, p. 8), and not contested by Applicant.

Neither of the primary references explicitly teaches the structure of an inner reflecting surface and outer reflective surface with a gap or air gap between them. However, Richardson et al. teach a method and apparatus for ultrasonic inspection of a tube component of a nuclear reactor utilizing an air gap as an efficient reflector of ultrasound radiation (col. 2, lines 64+). It would have been obvious to one skilled in the art to implement the air gap reflector, thus encompassing the remaining claimed features, in order to improve the operation of the reflector disclosed by Kato et al. Note that although Richardson et al. particularly deals with inspection, the nature of the technology is such that the improvements in the relevant components are applicable to ultrasonic technology in general.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexandra Awai whose telephone number is (571) 272-3079. The examiner can normally be reached on 9:30-6:00 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA
December 7, 2006

JACK KEITH
SUPERVISORY PATENT EXAMINER